Amendments to the Specification

Please replace the paragraph beginning on page 1, line 3, with the following rewritten paragraph:

The technical sector of the present invention is that of the vibro-acoustic filtering and damping of vibrations of mechanical origin transmitted between two structures so as to mutually ~~protection~~ protect them from their vibratory environment.

Please replace the paragraph beginning on page 1, line 13, with the following rewritten paragraph:

To ensure the system's mechanical strength, the structures or elements must be connected together by fastenings that ~~integrate~~ provide sufficient static or dynamic rigidity.

Please replace the paragraphs beginning on page 1, line 35, with the following rewritten paragraphs:

Elastic suspension, despite its ensuring static and dynamic strength with potential vibratory and/or acoustic gains, has a very slightly damped specific resonance, injecting at this resonating frequency, redhibitory levels in the structure to be protected (low frequency displacements or accelerations with respect to resonant modes).

Patents FR-2 674 590 and JP-2 658 887 describe hydraulic suspensions constituted by chambers filled with a viscous fluid communicating by a narrow channel. When the suspension is stressed by a shock or by vibrations inducing relative displacements, the fluid will preferentially circulate towards one chamber or other depending on the direction of excitation, with a laminating function that will convert the vibratory energy into local heat. The incompressibility of the fluid improves suspension strength and its circulation provides damping for the stresses introduced. These suspensions are largely used in the car industry, in

particular to uncouple the chassis from the running gear. However, they only function over a single degree of freedom and the viscosity of the fluid does not ensure the effectiveness of the behaviour over a wide frequency band. ~~These~~ All of them have a low cut-off frequency, which implies that these suspension/damping systems are reserved for very low frequency filtering.

Hyper-elastic suspensions are constituted by thick blocks of ~~elastomer~~ elastomeric materials according to patents FR-2 704 612 or FR-2762564 for example. The flexibility of these suspensions is incompatible with the need for static and dynamic rigidity and thus implies the installation of limit stops. The behaviour of these systems, obligatorily tri-axial, is complex and even random, thereby limiting prediction of dimensioning. Moreover, their behaviour at high frequency deteriorates (structural stiffening ~~effect)~~ effect beyond the cut-off frequency) and their material architecture ~~can not~~ cannot cope with the levels injected (premature ageing) thereby imposing wide safety margins in their dimensioning.

Please replace the paragraph beginning on page 4, line 11, with the following rewritten paragraph:

This state of the art thus enables on the one hand so-called "series" solutions that provide static and dynamic strength whilst enabling the filtering over a reduced low or high frequency band; and on the other, so-called "parallel" solutions ensuring a strong reduction in vibratory responses of the normal mode of the structures over a ~~wide frequency band.~~ frequency.

Please replace the paragraphs beginning on page 4, line 29, with the following rewritten paragraphs:

The invention thus aims to enable filtering with strong damping of the amplifications ~~to resonant~~ at resonant frequencies between two ~~structures, over a very wide band of frequency and amplitude of applied mechanical loads.~~structures.

The invention thus relates to a process to damp and filter the amplitude of mechanically-originated vibrations of a structure to be uncoupled, wherein the incident vibratory wave is filtered associated with damping, by providing absorption of the filtered vibratory wave transmitted ~~to the structure over a very wide very wide band of frequency and~~ over the frequencies and the mechanical load amplitude ~~applied to said structure.~~applied.

Please replace the paragraph beginning on page 5, line 17, with the following rewritten paragraph:

The invention also relates to a device to filter and damp the vibrations between a first element subjected to an incident vibratory wave and a second element radiating a filtered vibratory wave, wherein it comprises an interface structure to transfer vibratory energy constituted by at least one elastic component and at least one dissipative component attached in parallel to the elastic component to ensure the filtration and damping of the incident vibratory ~~wave.~~wave, a frequency and the mechanical load amplitude applied.

Please replace the paragraphs beginning on page 5, line 31, with the following rewritten paragraphs:

Advantageously again, the dissipative component is constituted by two separate rigid frames ensuring, punctually or continuously, deflection functions, if required, by a lever arm effect, amplification of the vibratory energies generated by the elastic components towards a dissipative material positioned between ~~them, said~~ them, this dissipative component providing damping for the elastic component.

According to one embodiment, the dissipative component has a ~~lineic~~ linear profile and is constituted by an assembly of rigid aligned frames, attached by their bases to the elastic components and independent of one another such that their relative movements, corresponding to an amplification by lever arm effect of the vibratory response of the elastic component, are transmitted by their ends to a dissipative material onto which a continuous or discontinuous stress plate is mounted to transfer the vibratory energy to the frame assembly.

Please replace the paragraphs beginning on page 6, line 28, with the following rewritten paragraphs:

Advantageously, the elastic leaf springs have potentially non-linear stiffness conferred by their evolutive geometric profile to ensure a gradual contact of the leaf spring with the matching profile of the other leaf spring, to ~~ensure an evolutive~~ provide the evolution of the filtering frequency ~~and controlled~~ and a controlled relative motion space of the leaves according to the dynamic load applied.

According to yet another embodiment, the interface structure is rotational or not and is composed of an elastic leaf spring rigidly connected to the element and an elastic leaf spring rigidly connected to the element, the springs being connected together at their free ends and wound around a ring, elastic or not, ~~by means of~~ using layers of dissipative materials, and coming into direct contact according to the dynamic load applied to ensure the non-linear filtering and damping function.

Advantageously, the elastic leaf springs have potentially non-linear stiffness thanks to their evolutive geometric profile and by the gradual contact between the leaf springs whose profiles reciprocally match their respective admissible maximal deformation, to ~~ensure,~~ provide, depending on the dynamic load applied, ~~evolutive~~ the evolution of the frequency and a controlled or even limited relative motion space of the elements.

Please replace the paragraphs beginning on page 7, line 25, with the following rewritten paragraphs:

One result of the present invention lies in the fact that the method for filtering and damping the amplitude of vibration phenomena of mechanical origin, transmitted to and/or radiated by structures towards an element or towards another part of a structure is notable in that it associates support, filtering and damping ~~functions over a wide range of functioning frequencies and excitation loads.~~functions, a frequency and mechanical load amplitude applied.

Another result of the present invention lies in the fact that the method for filtering and damping the amplitude of vibration phenomena of mechanical origin, transmitted to and/or radiated by structures towards an element or towards another part of a structure is notable in that it performs a so-called "series" function by its association with a so-called "parallel" process, functioning over a ~~wide frequency range.~~ frequency. In improving it, this association extends its field of application.

Please replace the paragraph beginning on page 8, line 14, with the following rewritten paragraph:

Another result of the invention lies in the association of a so-called series suspension for an object introducing non-linearities with the so-called parallel process notable in that it enables the performances of both ~~devices (wide frequency band,~~ devices, strong damping, strong excitation load) in a small volume at a reduced mass.

Please replace the paragraph beginning on page 8, line 25, with the following rewritten paragraph:

Yet another result of the invention lies in the fact that the elastic suspension enables the static retention of the load and the amplitudes of precise and limited dynamic movements over ~~the wide range of frequency~~ a frequency and excitation loads.

Please replace the paragraph beginning on page 9, line 22, with the following rewritten paragraph:

The association of a non-linear series suspension with known parallel damping devices is notable in that ~~is~~ it enables suspension to be obtained that has good damping performances ~~(wide frequency band, strong~~ (strong damping, strong excitation load) in a restricted volume at a reduced weight.

Please replace the paragraphs beginning on page 10, line 32, with the following rewritten paragraphs:

The invention aims at filtering the incident wave and damping the vibratory wave generated by the radiating surface of a material constituting an element subjected to vibrations of mechanical origin at the incident surface. ~~Said material~~ This material is composed of an association of elastic and dissipative structures defining an interface structure to transfer vibratory energy.

~~By material~~ A material with dissipative structure, is defined as a material ~~is meant~~ whose particles generate loads which are not proportional to the relative displacements imposed on them and which do not give back all the deformation energy transmitted.

Please replace the paragraphs beginning on page 11, line 27, with the following rewritten paragraphs:

Figure 1 schematises the principle retained to amplify the deformations which is based on the use of a strongly anisotropic material or structure 10. The interface structure 10 is interposed between a first element 2 rigidly attached to a support (not shown) and a second element 3 subjected to vibrations. This structure 10 is constituted by an assembly of elastic leaf springs 1 and dissipative components 7. These leaf springs 7 are given a geometry and orientation which pilots the evolution of stiffness non-linearity according to their elongation, and these leaf springs 1 can be observed to have a part 9 attached to element 3 and another part 11 attached to element 2. A damping device 7 is installed on each spring constituted by two frames 4 and 5 whose free ends are joined ~~by means of a~~ with a dissipative structure 6.

Even though the system is ~~fulyl~~ fully bijective, for the purposes of simplification and for the remaining embodiments described hereafter, element 2 is designated as the element via which the incident vibratory wave is transmitted, and element 3 as the element transmitting the radiating vibratory wave.

When the load fl transmitted by the wave Oi of vibratory origin is applied, the springs deform deflecting the direction of the incident vibratory direction by deforming according to a mechanism previously established on their own modal behaviour as shown by way of illustration in Figure 2. In parallel to each leaf spring, the damping device 7, thanks to the frames 4 and 5 judiciously positioned on each spring, enables these energies to be deflected and, if required, amplified. These are finally transmitted in a privileged direction or directions through the dissipative structure 6 ~~by means of the~~ with the frames 4 and 5.

Under the action of the dynamic load and thanks to the potential deformation types of the leaf spring 1, function of their evolutive profile, the distribution of the vibratory energies and the level of internal constraints in the springs 1 and consequently their stiffness are modified. Since this mechanism is established in advance, the damping device 7, effective over a ~~wide band,~~ frequency applied, is thus always able to dissipate these energies. In Figure 1, where the

deformation rate of the springs 1 is considered to be weak, the structure 10 is sufficiently flexible to statically support element 3, limits its motion space and filters the majority of the loads F1 at low or high frequency. In this case, the low or high frequency damping properties are used with slight deformation of the dissipative structure. In Figure 2, under a strong dynamic load F2, the stiffness of the springs 1 is strongly increased with their deformation rate. The structure 10 is thus stiffened thereby limiting the motion space to the required level. But under the combined action of the dynamic mass of element 3, this structure remains flexible enough to filter low frequencies. In this case, the ~~low or high frequency~~ damping properties are used with slight deformation of the dissipative structure.

Please replace the paragraph beginning on page 15, line 3, with the following rewritten paragraph:

The disturbance of the wave transmission between the incident 11 and radiating 9 surfaces is deflected towards the damping device 15 in a zone ensuring maximum relative rotations or displacements of the springs according to their deformation. The damping devices 15 caught between a rigid part of sub-assembly 12 and the elastic spring 14 and 16 enable the relative energies to be absorbed ~~by means of~~ <u>through</u> a suitable link whether rigid, rotoid, spherical or flexible along privileged directions.

Please replace the paragraph beginning on page 15, line 36, with the following rewritten paragraph:

According to the invention, the parallel damping device, used in the series suspension or with any other structure may have different profiles or geometries, so long as the damping process and device according to the invention are respected. The simplest form is shown in Figure 4, where the energy-converting material 6 may be arranged between the two rigid

plates 18 and 19 of the structure 7, itself linked to the spring 1 of any other vibrating element ~~by means of~~ using the rigid plates 4 and 5, reference being made to the embodiment shown in Figure 1. The privileged conversion functioning mode corresponds to a deflection of the vibratory energies from the spring 1, amplified by elements 4 and 5, towards plates 18 and 19, which transfer these energies to the dissipative material. In the case presented, dissipation is generated by a dynamic shearing of the material 6.

Please replace the paragraph beginning on page 17, line 25, with the following rewritten paragraph:

The external skin 50b is linked to a stress plate 27 ~~by means of a~~ with a dissipative component 6.

Please replace the paragraph beginning on page 17, line 30, with the following rewritten paragraph:

These differences in modes and deformation amplitude impart high levels of internal deformation to the dissipative material 6 over the ~~whole the treatment~~ whole treatment surface thereby ensuring efficient conversion of the vibratory energies.

Please replace the paragraph beginning on page 18, line 11, with the following rewritten paragraph:

Given the low stiffness in flexion of the stress plate 27 and the dissipative material 6, the assembly 7, during its installation, is able to adapt itself to the plan or warped geometry of the vibratory structure 1. Once rigidly linked to this structure 1 ~~by means of~~ using the skin 50a, the device 7 reintegrates all of the characteristics and performances of the generic concept presented in Figure 12.

Please replace the paragraph beginning on page 18, line 25, with the following rewritten paragraph:

In this embodiment, a dissipative component 7, shown as a section in Figure 9, is constituted by an assembly of independent leaf springs 22, joined at their central part. This central part is linked by the rigid interface 9 to the elastic component 1, or other vibrating structure, whose vibratory response is to be damped. Each spring 22 is provided with at least one undulation 24 enabling the vibratory movements perceived at the interface 9 to be amplified in privileged directions. The lower plane surface 26a at the end of each leaf spring 22 is connected to the component 1 ~~by means of a~~ with a dissipative component 25a. The upper plane surface 26b at the end of each spring 22 is connected to a stress plate 27 by ~~means of~~ another dissipative component 25b. The stress plate is continuous and thus enables a multitude of "daisy" motifs to be interconnected via the dissipative component 25, as has been schematised in Figure 8.

Please replace the paragraph beginning on page 19, line 9, with the following rewritten paragraph:

Figures 10 and 11 show, by judicious extension and association of the characteristics of the damping device, a variant of the filtering and damping device between an incident surface 9 and a radiating surface 11 based on the embodiment shown in Figure 3. Each cyclically symmetrical motif is thus constituted by a judicious assembly around a ring 30 of elastic leaf springs 31 and 32. This assembly integrates a damping function ~~by means of dissipative~~ with dissipative materials 33 arranged between the ring 30 and the spring 31 and dissipative materials 34 arranged between the springs 31 and 32, constituting an interface

structure. In this case, each of the motifs has bases constituting its incident and radiating surfaces with respect to the surrounding motifs.

Please replace the Abstract with the attached amended Abstract.